

REMARKS

Further and favorable reconsideration is respectfully requested in view of the foregoing amendment and following remarks.

Request for Examiner-Initialed PTO-1449 Form

On October 29, 2007 Applicants filed a Supplemental Information Disclosure Statement, citing the references identified in the Supplementary European Search Report, together with a copy of the search report which is in the English language. The Examiner crossed through reference EP 0 298 336, thus indicating that the reference has not been considered. It appears that this reference was not considered because it was not submitted with an English language abstract or partial/full translation. However, in accordance with MPEP 609.04(a)(III), the requirement for a concise explanation of relevance for non-English language information is satisfied if the reference is cited on and submitted with an English language search report. As stated previously, this reference was cited on the Supplemental European Search Report, which is in English, and was submitted together with the IDS. Accordingly, the Examiner is respectfully requested to consider the reference, initial next to the reference on the attached PTO-1449 Form, and return the initialed PTO-1449 Form to Applicants' representative with the next correspondence.

Specification Amendments

The title has been amended in accordance with the Examiner's suggestion.

Applicants note that the title on the first page of the international application differs from the title on page 1 of Applicants' specification. Applicants further note that title suggested by the Examiner (now the amended title) is the same as the title on page 1 of Applicants' specification.

The Examiner indicates that there is a typographical error in the title. It appears that the Examiner is referring to the title as found on the Filing Receipt mailed May 7, 2007, which contained a typographical error. In order to expedite prosecution, Applicants have amended the title in accordance with the Examiner's request.

No new matter has been added to the application by this amendment.

Rejection Under 35 U.S.C. § 112, Second Paragraph

The rejection of claim 1 as being incomplete for omitting essential elements, under 35 U.S.C. § 112, second paragraph, is respectfully traversed.

The Examiner takes the position that claim 1 is incomplete for omitting an isocyanate reactive group in the base polyolefin. The Examiner states that without the inclusion of an isocyanate reactive group (i.e., hydroxyl, amine, etc.) on the polymer, the chlorinated polyolefin will not react with the added isocyanate compounds. The Examiner states that assuming the claimed invented composition is a crosslinked polyurethane resin, it would be necessary to have a functional group reactive towards the crosslinking group present in the backbone.

Applicants respectfully disagree with the Examiner's position, because the claimed resin composition is not crosslinkable. It is sufficient that Applicants' resin composition comprises 100 parts by weight of a chlorinated polyolefin having a chlorine content of 10 to 50% by weight, 0.01 to 10 parts by weight of tris(isocyanatophenyl)thiophosphate, and 2 to 40 parts by weight of an organic diisocyanate compound. The chlorinated polyolefin is not required to have a functional group capable of reacting with an isocyanate group.

Accordingly, Applicants respectfully assert that the above rejection is untenable and should be withdrawn.

Patentability Arguments

The patentability of the present invention over the disclosures of the references relied upon by the Examiner in rejecting the claims will be apparent upon consideration of the following remarks.

Rejection Under 35 U.S.C. § 103(a)

The rejection of claims 1-11 under 35 U.S.C. § 103(a) as being unpatentable over Suganuma et al. (U.S. 2003/0069353), as well as Fry et al. (U.S. 4,954,573) and Sanders et al. (U.S. 4,870,206) is respectfully traversed.

The Position of the Examiner

The Examiner takes the position that Suganuma et al. teach a water-dispersible polyisocyanate composition comprising a hydrophobic polyisocyanate (A) and a vinyl polymer having a nonionic group and an isocyanate group (B), wherein the vinyl polymer may be a fluoroolefin polymer. The Examiner asserts that without unexpected results, due to the limited number of halogens and the similarities between them, the use of a fluorinated polyolefin reads on Applicants' claimed chlorinated polyolefin.

The Examiner also states that, regarding the polyisocyanate, the prior art teaches the use of a variety of isocyanates including both diphenylmethane-4,4'-diisocyanate and tris(isocyanatophenyl)thiophosphate.

The Examiner admits that Suganuma et al. fail to teach the amount of the halogen. The Examiner states that Fry et al. teach chemically-modified, chlorinated, polyolefins having improved properties of solvent and/or humidity resistance, wherein the chlorinated polyolefin should have a chlorine content of from about 10 to about 40 weight percent, preferably about 20 to 24 weight percent. Thus, the Examiner asserts that to obtain a polymer having good solubility as well as resistance, it would have been obvious to one having ordinary skill in the art to use a polyolefin containing between 20% and 24% of a halogen.

The Examiner also admits that the prior art is silent with respect to the motivation to use tris(isocyanatophenyl)thiophosphate. The Examiner states that Sanders et al. teach the synthesis of aromatic polyisocyanate and their use as components for adhesives, and that thiophosphoric acid tris-(p-isocyanatophenylester) is a well-known, typical example of a suitable starting material. Thus, the Examiner asserts that it would have been obvious to one having ordinary skill in the art to have used this component as the hydrophilic isocyanate as disclosed in the composition of Suganuma et al.

Applicants' Arguments

Applicants respectfully disagree with the Examiner's position for the following reasons.

Applicants' claimed resin composition has unexpected and advantageous results. For example, a coating material which is excellent in adhesiveness to a synthetic resin, particularly to

an olefin-based resin, may be obtained by adding Applicants' claimed resin composition to a coating material. Additionally, an adhesive which is excellent in adhesiveness to a synthetic resin, particularly to an olefin-based resin, can be obtained by adding Applicants' claimed resin composition to an adhesive. Further, a printing ink which is excellent in attachment to a synthetic resin, particularly to an olefin-based resin, can be obtained by adding Applicants' claimed resin composition to a printing ink.

Examples 1 to 8 of Applicants' specification (Table 1, page 18) disclose resin compositions obtained by mixing a chlorinated polypropylene having a chlorine content of 19 to 22% by weight, tri(isocyanatophenyl)thiophosphate, and 4,4'-diphenylmethanediisocyanate as an organic diisocyanate compound, at predetermined ratios.

Paragraph [0045] (on page 15 of Applicants' specification) indicates that 20 parts by weight of Applicants' resin composition is added to 80 parts by weight of an acrylic resin coating material.

Originally, acrylic resin coating materials are low in attachment to olefin-based thermoplastics and olefin-based resins, such as polypropylene. However, by adding Applicants' resin composition to an acrylic resin coating material, the acrylic resin coating material is provided with excellent attachment to polypropylene plates and olefin-based thermoplastic elastomer plates. (Please see Table 1 on page 18 of Applicants' specification.)

Furthermore, conventional two-component type urethane-based resin coating materials are low in attachment to olefin-based thermoplastic elastomers and olefin-based resins, such as polypropylene. However, paragraph [0044] (on page 15 of Applicants' specification), describes a two-component type urethane-based resin coating material comprising 80 parts by weight of a diol compound and 20 parts by weight of a resin composition. The two-component type urethane-based resin coating material is excellent in attachment to polypropylene plates and olefin-based thermoplastic elastomer plates. (Please see Table 1 on page 18 of Applicants' specification.)

On the contrary, please consider the comparative examples set forth in Table 2 on page 19 of Applicants' specification. Specifically, Comparative Example 1 discloses a resin composition which does not contain tris(isocyanatophenyl)thiophosphate. Comparative Example 2 discloses a

resin composition in which the amount of tris(isocyanatophenyl)thiophosphate exceeds 10 parts by weight, which is the upper limit recited in Applicants' claims. Comparative Example 3 discloses a resin composition which does not contain a chlorinated polypropylene. Comparative Example 4 discloses a resin composition in which the amount of 4,4'-diphenylmethanediisocyanate is smaller than 2 parts by weight, which is the lower limit recited in Applicants' claims. Comparative Example 5 discloses a resin composition in which the amount of 4,4'-diphenylmethanediisocyanate exceeds 40 parts by weight, which is the upper limit recited in Applicants' claims. Comparative Example 6 discloses a resin composition in which the amount of tris(isocyanatophenyl)thiophosphate exceeds 10 parts by weight, which is the upper limit recited in Applicants' claims.

Even when the resin compositions discussed in these comparative examples were added to acrylic resin coating materials, the attachment of the acrylic resin coating material to polypropylene plates and olefin-based thermoplastic elastomer plates were not improved.

As described above, Applicants' resin composition improves attachment of a coating material, an adhesive or a printing ink to a synthetic resin, only when the resin composition contains a chlorinated polyolefin having a chlorine content of 10 to 50% by weight, tris(isocyanatophenyl)thiophosphate, and an organic diisocyanate compound, at predetermined ratios.

The Examiner has taken the position that absent unexpected results, the teaching in Suganuma et al. of a fluoroolefin polymer, reads on Applicants' recited chlorinated polyolefin. However, Applicants respectfully disagree. Even when a fluorinated polyolefin is used instead of Applicants' recited chlorinated polyolefin, the advantageous effects of Applicants' resin composition are not obtained.

Although Fry discloses a chlorinated polyolefin, the reference fails to teach or suggest using tri(isocyanatophenyl)thiophosphate and an organic diisocyanate compound in combination. Further, although Sanders et al. (column 6, line 22) describes some polymers as examples, these are all unsaturated polymers and a chlorinated polyolefin-based resin is not disclosed at all. Thus, the secondary references fail to remedy the deficiencies of the primary reference, i.e. Suganuma et al.

As is apparent from the above-described Comparative Examples 1 to 6, in the resin composition of Applicants' claims, the contents of tri(isocyanatophenyl)thiophosphate and an organic diisocyanate compound relative to a chlorinated polyolefin are extremely important. If the content of any of the compounds deviates from the predetermined range, the resulting resin composition would not exert the above-described excellent effects, as are achieved by Applicants' claimed composition.

Neither Sugunuma et al., Fry et al. nor Sanders et al., taken alone or in combination, teach or suggest the combined use of a chlorinated polyolefin, tris(isocyanatophenyl)thiophosphate and an organic diisocyanate compound, particularly in the amounts required by Applicants' claims.

For these reasons, the invention of Applicants' claims is clearly patentable over the cited combination of references.

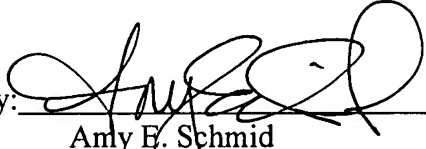
Conclusion

Therefore, in view of the foregoing amendments and remarks, it is submitted that each of the grounds of rejection set forth by the Examiner has been overcome, and that the application is in condition for allowance. Such allowance is solicited.

If, after reviewing this Amendment, the Examiner feels there are any issues remaining which must be resolved before the application can be passed to issue, the Examiner is respectfully requested to contact the undersigned by telephone in order to resolve such issues.

Respectfully submitted,

Shinichi YOSHIKAWA et al.

By: 

Amy E. Schmid
Registration No. 55,965
Attorney for Applicants

AES/emj
Washington, D.C. 20006-1021
Telephone (202) 721-8200
Facsimile (202) 721-8250
December 15, 2008